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REVIEW

OPEN

Enhanced cognitive behavioural therapy for patients with eating disorders: a systematic review

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Purpose of review
The aim of this study was to provide an update of the most recent (since January 2014) enhanced cognitive behavioural therapy (CBT-E) effectiveness studies (randomized controlled trials and open trials) on bulimia nervosa, binge eating disorder and transdiagnostic samples.

Recent findings
Out of 451 screened studies, seven effectiveness studies (five randomized and two open trials) were included in this review: of these, three had a bulimia nervosa sample and four a transdiagnostic sample (all conducted in an outpatient setting). Substantial differences in posttreatment remission rates were found (range: 22.2–67.6%) due, in part, to differences in samples and operationalization of clinical significant change.

Summary
There is robust evidence that CBT-E is an effective treatment for patients with an eating disorder. However, more studies on differential effects and working mechanisms are required to establish the specificity of CBT-E.

Keywords
cognitive behavioural therapy, eating disorders, effectiveness, transdiagnostic, treatment

INTRODUCTION

Eating disorders are severe mental disorders, which often begin in adolescence [1], frequently have a chronic course [2] and can have considerable impact on quality of life [3]. Eating disorders make a substantial contribution to the global burden of disease, especially among young women [4]. Although anorexia nervosa is a relatively rare disorder in many non-western countries, bulimia nervosa and binge eating disorder (BED) are common disorders worldwide [5]. Previous reviews showed that, among young women in Europe, Asia, Africa and Latin America, bulimia nervosa is reported by 1–2% and BED by 1–4% [6–10]. Recent studies show that eating disorders (especially bulimia nervosa and BED) are also common among older persons; according to the DSM-5 criteria, the prevalence of all eating disorders combined is around 3.5% in older (aged >40 years) women and around 1–2% in older men [11]. Despite that increasing numbers of individuals with eating disorders are receiving treatment, European samples show that only about one-third are detected via healthcare [6].

In terms of the DSM-IV, the most common eating disorder diagnosis in both clinical and community samples was 'Eating disorder not otherwise specified' (EDNOS). With the introduction of the DSM-5 and concurrent changes in the eating disorder section (including the introduction of BED as an official category, and lowering the threshold for anorexia nervosa and bulimia nervosa), the percentage of 'Other specified feeding or eating disorder' (OSFED; DSM-IV EDNOS) was significantly reduced, even though this diagnosis might still be the most common one in this population [12–14].

According to a recent international comparison between nine evidence-based clinical guidelines for

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KEY POINTS

- There is robust evidence that CBT-E is an effective treatment for adult patients with an eating disorder, especially for bulimia nervosa, BED and OSFED.
- The substantial range in remission rates between studies is partly due to differences in study samples and the definition used for clinical significant change.
- Although IPT is an evidence-based treatment for bulimia nervosa and BED, the first direct comparison between IPT and CBT-E showed CBT-E to be more effective.
- CBT-E is a far more (cost-)effective treatment for bulimia nervosa than psychoanalytic treatment on the main parameters of bulimia nervosa, that is binge eating and purging.
- Future research should focus on the working mechanisms and differential effects of CBT-E compared with other CBT protocols to establish the specificity of CBT-E.

eating disorders, cognitive behavioural therapy (CBT) is widely used as the preferred treatment for bulimia nervosa and BED [15▪]. The major guidelines for the treatment of eating disorders [16–18] recommend CBT as the psychological treatment of first choice for bulimia nervosa and BED. CBT-E (enhanced) is a specific form of CBT and is designed to be suitable for the full range of eating disorder diagnoses [19]. It is based on the transdiagnostic theory of the maintenance of eating disorders, in which it is assumed that most of the mechanisms involved in the persistence of eating disorders are common to all eating disorders, rather than being specific to each diagnostic group separately. It asserts that central to all eating disorders is a dysfunctional evaluation of self-worth that is overly based on shape and weight [20]. CBT-E uses strategies and procedures to address this overevaluation of shape and weight by focusing on targeting these mechanisms (known as the 'focused' version of CBT-E). The treatment protocol can be extended with interventions that target additional maintaining mechanisms, that is core low self-esteem, clinical perfectionism and interpersonal problems (known as the 'broad' version of CBT-E). For the OSFED diagnoses, CBT-E has an advantage over other CBT protocols because of its transdiagnostic reach. CBT-E has been investigated in several samples in which CBT-E for bulimia nervosa, BED and EDNOS proved to be a successful treatment in the first studies after development of the CBT-E protocol [21,22].

This review provides an update of the most recent (i.e. published since 2014) CBT-E effectiveness studies [randomized controlled trials (RCTs) and open trials] on bulimia nervosa, BED and transdiagnostic samples. Studies on the transdiagnostic samples include bulimia nervosa, BED, OSFED and, sometimes (i.e. in studies with lower BMI inclusion criteria), anorexia nervosa. However, excluded from the present review were studies with an anorexia nervosa sample alone, due to differences in treatment duration and other treatment variables (e.g. a focus on weight gain).

In this review, the characteristics of the included studies are described, possible explanations for the variability in outcome are proposed, recommendations are made for future research and the methodological quality of the RCTs is described. Due to the small number of included studies, no meta-analysis was performed.

MATERIALS AND METHODS

Search strategy and study selection

The primary search strategy was made in Medline, PsycInfo and EMBASE; the search covered the period from January 2014 up to March 2018. The following concepts were combined and searched for in the title and abstract:

(1) Eating Disorder OR disordered eat* OR binge eating disorder OR bulimia nervosa
(2) Cognitive-behavioral OR CBT OR CBT-E

Articles had to meet the following criteria: a peer-reviewed study; including a sample that meets the criteria for bulimia nervosa or BED, or a transdiagnostic sample with an eating disorder; and an effectiveness study that includes (at least one condition of) manualized CBT-E.

After removing duplicates, 451 articles (published January 2014–March 2018) were selected. The titles and abstracts of these articles were screened by the first author. The full-text versions of potential articles ($n = 35$) were read to check for eligibility. The reference lists of the included articles and reviews were also examined for relevant studies.

Finally, seven articles met the inclusion criteria (Fig. 1).

This review also includes an assessment of the methodological quality of the included RCTs. Tarrier and Wykes [23] developed the Clinical Trials Assessment Test (CTAM), based on relevant features from the CONSORT guidelines [24], to assess the quality of trials of psychological treatments in mental health. This test contains 15 items grouped into six areas. Total scores range from 0 (no criterion is

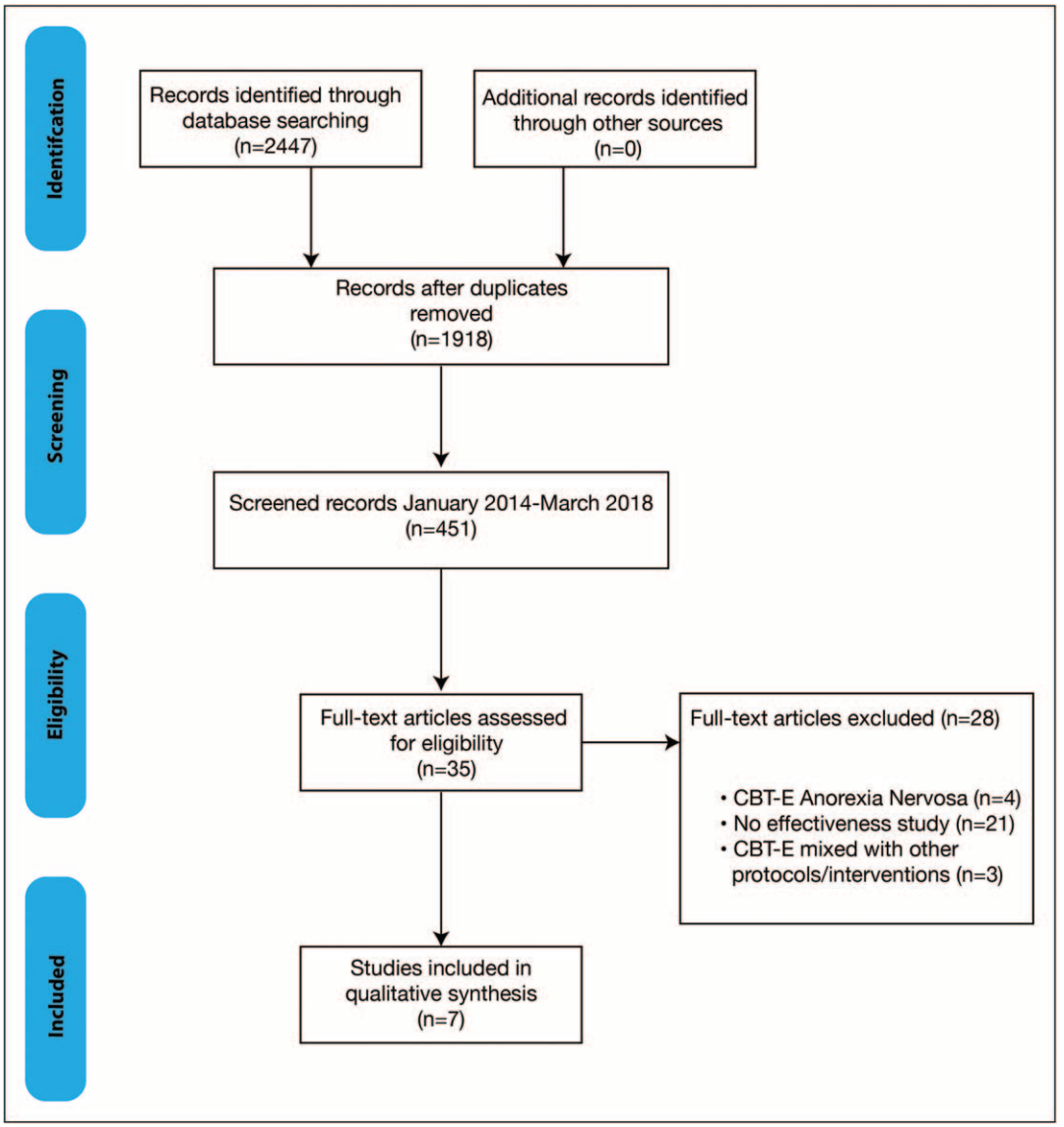

FIGURE 1. Flow diagram of inclusion of studies for this review.

reached) to 100 (maximum score). The CTAM has good blind inter-rater agreement and adequate internal consistency [23].

Ratings were done by the first author and one other independent rater. When required information was missing, the first author contacted the trial researchers for (possible) clarification.

RESULTS

If data were not reported, a calculation was made (when possible) based on the available data.

Design

Of the seven included studies, five were RCTs [25▪▪,26▪,27▪▪,28▪,29], and two were open trials [30,31▪]. Of the two open trials, one specifically aimed to find evidence that CBT-E is generalizable to treatment conducted in a noncontrolled clinical context [31▪].

Recruitment and population

All seven studies were conducted in an outpatient setting. Three studies included participants who were seeking help and had been referred [27▪▪,30,31▪]. Four studies also recruited participants through distribution of information in local papers, flyers, e-mails or (online) advertisements [25▪▪,26▪,28▪,29]. Four studies included a transdiagnostic sample [27▪▪,29,30,31▪], two studies included participants with bulimia nervosa only [25▪▪,26▪] and one study included participants with bulimia

nervosa and comorbid (subthreshold) borderline personality disorder [28▪]. Two transdiagnostic samples also included participants with anorexia nervosa [29,31▪]; this is explained by the use of a variable low-range cut-off for BMI, ranging substantially from 16 to 18.5. The Eating Disorder Examination (EDE) [32] is generally regarded as the gold standard in the assessment of an eating disorder. In five studies, the diagnoses were assessed with the EDE [25▪▪,26▪,27▪▪,28▪,29]. In one study, the eating disorder was assessed by the treating therapists on the basis of the DSM-IV criteria [31▪], and in one study, no information was provided on how the eating disorder was diagnosed [30]. Most studies included adults, although one study evaluated the effects of CBT-E in a cohort of nonunderweight adolescents [30]. There was a considerable difference in the number of participants per study (see Table 1).

Primary outcome measure and operationalization of clinical significant change

In all studies, the EDE [32], or its self-report version (EDE-Q) [33], was used as the primary outcome measure. Four studies used the EDE [25▪▪,26▪,27▪▪,28▪] and three the EDE-Q [29,30,31▪]. In all four studies using the EDE as primary outcome measure, the EDE was assessed by independent blinded assessors [25▪▪,26▪,27▪▪,28▪]. However, studies used different definitions of clinical significant change to indicate relevant change (e.g. remission, good outcome, abstinence, minimal residual eating disorder psychopathology and so on) and different operationalizations of these concepts. In the studies with a bulimia nervosa sample [25▪▪,26▪,28▪], abstinence from binges and purging was the main definition for clinical significant change. In the transdiagnostic samples, a global EDE-(Q) score less than 1 SD above the community mean (sometimes combined with BMI $\geq$18.5) was defined as clinical significant change [27▪▪,29,30,31▪] (Table 1). The two studies conducted in Australia [29,31▪] used different EDE-Q norms; although both studies refer to Mond *et al.* [34] for the norms used to indicate clinical significant change (less than 1 SD above the community mean, i.e. $\leq$2.77), the EDE-Q norms reported by Signorini *et al.* [31▪] were 2.46 or less.

Cognitive behavioural therapy enhanced variant

The seven included studies varied in the setting in which therapy took place, whether the focused or broad version of CBT-E was investigated, the duration of therapy and whether extra sessions were planned involving significant others.

Four studies investigated the individual 20-session variant of the focused version of CBT-E [25▪▪,26▪,27▪▪,28▪]. In the study of Dalle Grave *et al.* [30], parents were involved more closely, as participants were adolescents; the parental involvement consisted of five sessions of patients and parents together. Details about which version of CBT-E was investigated in this study were not reported. Wade *et al.* [29] developed a treatment manual for group CBT-E based on the individual broad version of CBT-E including sessions to address the additional maintaining mechanisms (i.e. core low self-esteem, clinical perfectionism and interpersonal problems). Eighteen group sessions of 2 h each were offered (with 5–10 min of individual work before each group session), and two additional individual sessions of 50 min each. In the study of Signorini *et al.* [31▪], although CBT-E was investigated according to the manual [19], there was variability in the number of sessions (40 sessions for underweight participants, 20 sessions for nonunderweight participants) and also in the use of the focused or the broad version of CBT-E.

Control group

Of the five RCTs, three compared CBT-E with another active condition [25▪▪,26▪,27▪▪]. In one study, CBT-E was compared with psychoanalytic psychotherapy [25▪▪]. In the study of Wonderlich *et al.* [26▪], CBT-E was compared with a new psychotherapeutic treatment for bulimia nervosa, that is integrative cognitive-affective therapy (ICAT). In the study of Fairburn *et al.* [27▪▪], CBT-E was compared with another evidence-based treatment for bulimia nervosa: interpersonal psychotherapy (IPT). In two of these three studies, the therapy dosage was the same in both groups [26▪,27▪▪], but in one study, the duration of therapy differed greatly due to the nature of psychoanalytic psychotherapy [25▪▪], that is the psychoanalytic psychotherapy involved weekly sessions of 50 min each over 2 years (mean number of sessions 72.3). Thompson-Brenner *et al.* [28▪] compared the focused and broad version of CBT-E in persons with comorbid bulimia nervosa and borderline personality disorder. In the RCT of Wade *et al.* [29], the control group was a waiting list group; however, in that study, only the first 8 weeks were controlled for; after this period, the control group had a delayed treatment start.

Therapist competence/treatment integrity

In four of the seven studies, the founder of CBT-E (Christopher Fairburn) or his colleague (Zafra

Table 1. Cognitive behavioural therapy enhanced studies (published January 2014–March 2018): study characteristics and operationalization of clinical significant change

Ref.	Country	Design	*N*	Sample	BMI	Measure	Condition	Operationalization of clinical significant change			Clinical significant change posttreatment	Result
								Global EDE(-Q) less than 1 SD above community mean	BMI ≥18.5	Binging and/or purging[d]		
Poulsen *et al.* [25▪▪]	Denmark	RCT	70	BN	-	EDE	CBT-Ef psychoanalytic psychotherapy	No	No	Yes	42% 15%	CBT-E > psychoanalytic psychotherapy
Wonderlich *et al.* [26▪]	USA	RCT	80	BN	≥18	EDE	CBT-Ef ICAT	No	No	Yes	22.5% 37.5%	ns
Fairburn *et al.* [27▪▪]	UK	RCT	130	BN; 40.8% BED; 6.2% EDNOS; 53.1%	17.5–40	EDE	CBT-Ef IPT	Yes (i.e. ≤1.74)	No	No	65.5% 33.3%	CBT-E > IPT
Thompson-Brenner *et al.* [28▪]	USA	RCT	50	BN & BPS	-	EDE	CBT-Ef CBT-Eb	No	No	Yes	44% 40%	ns
Wade *et al.* [29]	Australia	RCT[b]	40	AN; 20% BN; 57.5% BED; 5% OSFED; 17.5%	17.5–30	EDE-Q	Group CBT-Eb waiting list	Yes (i.e. ≤2.77)	Yes	No	66.7%[e]	CBT-E > WT[b]
Dalle Grave *et al.* [30][a]	Italy	Open trial	68	BN; 29.4% BED; 20.6% EDNOS; 50%	≥18.5	EDE-Q	CBT-E[c]	Yes (i.e. ≤2.77)	No	No	67.6%	–
Signorini *et al.* [31▪]	Australia	Open trial	114	AN; 20.8% BN; 36.8% EDNOS; 42.5%	≥16	EDE-Q	CBT-Ef/Eb	Yes (i.e. ≤2.46)	Yes	No	42.2%[f] 35.4%[e]	–

AN, anorexia nervosa; BED, binge eating disorder; BN, bulimia nervosa; BPS, borderline personality disorder; CBT-Eb, cognitive behavioural therapy enhanced broad version; CBT-Ef, cognitive behavioural therapy enhanced focused version; EDE, Eating Disorder Examination; EDE-Q, Eating Disorder Examination Questionnaire; EDNOS, eating disorder not otherwise specified; ICAT, integrative cognitive-affective therapy; IPT, interpersonal psychotherapy; ns, not significant; OSFED, other specified feeding or eating disorder; RCT, randomized controlled trial; WT, waiting list.

[a]Sample: adolescents.

[b]First 8 weeks controlled.

[c]Version not defined.

[d]Criterion: abstinence of binging/purging in the past 4 weeks.

[e]Global EDE(-Q) score less than 1 SD above the community mean and BMI ≥18.5.

[f]Global EDE(-Q) score less than 1 SD above the community mean.

Cooper) was closely involved in the training and supervision of the therapists [25▪▪,27▪▪,28▪,30]. The remaining studies were supervised by experienced therapists [26▪,29,31▪]. In six studies, the frequency of supervision was weekly or biweekly [25▪▪,26▪, 27▪▪,28▪,29,30]. In the study of Signorini *et al.* [31▪], the frequency of supervision was reported to be 'regular'. In three studies, the sessions were audio-recorded and a selection of these sessions was used and/or reviewed for purposes of supervision [27▪▪,28▪,30].

In three studies, treatment integrity was measured [25▪▪,26▪,27▪▪]. The quality of the delivery of the treatment condition was assessed by independent raters using diverse adherence scales. In these three studies, the raters scored adherence as 'good' [26▪] or as 'high' [25▪▪,27▪▪].

Noncompleters

The operationalization of 'completion' also differs between studies. In four studies, 'completion' was operationalized as finishing the complete treatment [25▪▪,27▪▪,29,30]. Wonderlich *et al.* [26▪] defined completion as attending at least 16 sessions (of 21). In two studies [28▪,31▪], it is not clear how completion was operationalized. Noncompletion rates ranged from 22.2 to 50%. In the open trial of Signorini *et al.* [31▪], an attrition rate of 50% was reported, whereas the other open trial [30] reported a substantially lower rate (25%) of noncompleters. In four of the RCTs, the rate of noncompleters was similar, ranging from 22.2 [25▪▪] to 26.2% [27▪▪]. In the RCT of Wade *et al.* [29], 30% of the participants did not complete treatment.

Analysis

All reported results are based on an intention-to-treat analysis.

Randomized controlled trials

Of the five RCTs, three reported significant differences between groups in favour of CBT-E [25▪▪,27▪▪,29]. Wade *et al.* [29] found that the first 8 weeks of group CBT-E were more effective in terms of reducing EDE-Q global scores compared with no treatment. In the study of Fairburn *et al.* [27▪▪], the levels of eating disorder psychopathology decreased (global EDE score) in both conditions (CBT-E and IPT); however, the changes were significantly greater among CBT-E participants. The percentage of CBT-E participants in remission was almost twice as high as that in participants who received IPT (65.5 vs. 33.3%). In the study of Poulsen *et al.* [25▪▪], there was a large variation in treatment duration (5 months CBT-E vs. 24 months psychoanalytic psychotherapy). Significant differences were found between groups for binge eating and purging; 42% of the patients in CBT-E had ceased binge eating and purging (after 5 months) compared with 15% of the patients in psychoanalytic psychotherapy (after 24 months). By the end of both treatments, although there were substantial improvements in eating disorder psychopathology (global EDE scores), these changes took place more rapidly in CBT-E. In two out of five RCTs, no significant differences were found. In the study of Thomson-Brenner *et al.* [28▪], two versions of CBT-E were compared (focused version vs. broad version). The groups did not differ in primary outcome and the remission rate of the total sample was 42%. In addition, in the study of Wonderlich *et al.* [26▪], comparing CBT-E with ICAT, no significant differences in treatment outcome were found between groups.

Open trials

In both open trials, there was a significant decrease in EDE-Q scores [30,31▪] (Table 2). Dalle Grave *et al.* [30] reported a remission rate of 67.6%; however, a substantial percentage of their patients (25%) met the criteria for remission *before treatment* started. Signorini *et al.* [31▪] used two different definitions of remission and reported a remission rate of 42.2 and 35.4%, respectively. As mentioned, in the study of Wade *et al.* [29], a control condition was included only in the first 8 weeks; after having received a full dosage of CBT-E, the remission rate for all patients

Table 2. Changes in Eating Disorder Examination Questionnaire global score in open trials: intention-to-treat analysis

Ref.	*N*	Pre-treatment Mean Global EDE(-Q) (SD)	Post-treatment Mean Global EDE(-Q) (SD)	Follow-up Mean Global EDE(-Q) (SD)
Dalle Grave *et al.* [30]	68	3.6 (1.5)	1.8 (1.8)[a]	-
Signorini *et al.* [31▪]	108	4.03 (1.29)	3.09 (1.76)[a]	3.10 (1.76)
Wade *et al.* [29]	39	4.37 (1.19)	2.36 (1.31)[a]	2.67 (1.44)

EDE, Eating Disorder Examination; EDE-Q, Eating Disorder Examination Questionnaire; SD, standard deviation.
[a]Significant at $P < 0.05$.

(whether in the experimental or control group) was 66.7% (Table 1).

Differences in outcome, in RCTs and open trials, are explained in part by differences in the definition of clinical significant change and in the level of the EDE-Q community mean (Table 1).

Follow-up

Of the seven included studies, five had a follow-up assessment period varying from 3 months [29], 4 months [26▪], 20 weeks [31▪], 6 months [28▪] to 60 weeks [27▪▪]. Generally, in most studies, the posttreatment results were maintained during follow-up. In the study of Wade *et al.* [29], during follow-up, the percentage 'good outcome' decreased from 66.7 to 46.2%. In the study of Fairburn *et al.* [27▪▪], the proportion of participants meeting the criteria for remission during follow-up increased in the IPT condition (33.3 to 49.0%), but the rate remained higher (69.4%) in CBT-E.

Assessing quality and variability in psychological treatment trials: the Clinical Trial Assessment Measure

We used the CTAM [23] to assess the methodological quality of the included RCTs (see Materials and methods). Three of the five RCTs had a similarly high CTAM score of 89 [25▪▪,26▪,27▪▪], indicating good methodological quality. One of the RCTs described the process of assessor blinding [28▪], but none of them verified the blinding of assessors at the end of the study. In the study of Thompson-Brenner *et al.* [28▪], due to the small sample size and lack of measurement of treatment quality, the CTAM score was 7 points lower. Compared with the other four RCTs, the trial of Wade *et al.* [29] had a lower CTAM score; this latter study had a small sample size, no independent randomization, no description of randomization, no active control condition and no assessment of treatment quality.

A full description and ratings of the CTAM are available on request from the first author.

DISCUSSION

The findings of this systematic review of seven effectiveness studies (five RCTs and two open trials) replicate and extend findings from two earlier studies [21,22], demonstrating that CBT-E is an effective treatment for bulimia nervosa, BED and transdiagnostic samples of adult patients with an eating disorder. Since 2014, several RCTs made a direct comparison between CBT-E and other active treatment conditions, such as interpersonal psychotherapy (IPT), psychoanalytic psychotherapy and integrative cognitive-affective therapy (ICAT). Although IPT is also an established evidence-based treatment for bulimia nervosa and BED [35], the first direct comparison made between IPT and CBT-E in a transdiagnostic eating disorder sample, showed that CBT-E was more effective [27▪▪]. In another comparison in a bulimia nervosa sample, 20 weeks of CBT-E was compared with 2 years of psychoanalytic psychotherapy [25▪▪]. At the end of treatment, the considerable difference in remission rates of binge eating and purging in favour of CBT-E (in combination with the substantial differences in treatment duration) demonstrates that CBT-E for bulimia nervosa is highly cost-effective compared with psychoanalytic psychotherapy. One study was the first to show that ICAT (a new psychotherapeutic treatment for bulimia nervosa) might be as effective as CBT-E [26▪]. Furthermore, group CBT-E seems to be an acceptable alternative to individual CBT-E [29]. In a bulimia nervosa sample with comorbid borderline personality disorder, no difference in effect was found between the focused and the broad version of CBT-E [28▪]. The study of Dalle Grave *et al.* [30] showed that CBT-E might be a potential treatment approach for nonunderweight adolescents with an eating disorder. Although Family-Based Treatment (FBT) is the preferred treatment for adolescents with bulimia nervosa [36], CBT-E might be a possible alternative when, for example, FBT is not sufficiently effective or not available. Finally, the study of Signorini *et al.* [31▪] showed that CBT-E is generalizable to a noncontrolled clinical context. However, that study had a high attrition rate of up to 50%, possibly due to the high percentage of participants with anorexia nervosa (20.8%) in their sample. In an earlier open trial [22] with a transdiagnostic sample including anorexia nervosa, the attrition rate was also high (40%).

In this review, substantial differences were found in posttreatment remission rates (22.2–67.6%); when interpreting these differences, several issues need to be considered. First, studies are difficult to compare due to variation in the included samples, differences in the definition of clinical significant change and differences in the methodological quality of the studies. For example, in the study of Dalle Grave *et al.* [30], the high proportion that met the criteria for remission at baseline (25%) biases the relatively high posttreatment remission rate (67.6%). Also, the difference in 'good outcome' between the studies of Wade *et al.* [29] and Signorini *et al.* [31▪], both carried out in Australia, can be explained, in part, by the different EDE-Q community mean used for the definition of clinical

significant change. Signorini *et al.* [31▪] found a posttreatment remission rate of 42.2% (EDE-Q score ≤2.46), whereas Wade *et al.* [29] reported 66.7% (EDE-Q score ≤2.77).

Moreover, differences between the studies are not always easy to explain. For example, the substantial difference in outcome of CBT-E between the study of Poulsen *et al.* [25▪▪], with a posttreatment abstinence rate of 42% compared with the 22.5% reported by Wonderlich *et al.* [26▪] is puzzling, as both studies are similar regarding their samples, operationalization of clinical significant change (abstinence of binge eating/purging) and both are of good quality. One difference between these studies is that, in the study of Poulsen *et al.* [25▪▪], the founder of CBT-E was closely involved in the training and supervision of the therapists. Another is how completion was operationalized. Poulsen *et al.* [25▪▪] defined completion as finishing the complete treatment, whereas Wonderlich *et al.* [26▪] defined completion as attending at least 16 sessions.

A strong point of the present study is that it is the first review on CBT-E to assess the methodological quality of the included RCTs. Moreover, the results of this assessment indicate that, overall, the quality of the studies was high.

Taken together, the effectiveness studies of CBT-E for bulimia nervosa, BED and transdiagnostic samples (published since January 2014), of which four RCTs with high methodological quality, provide additional and robust evidence that CBT-E is indeed an effective treatment for patients with eating disorders.

This systematic review excluded CBT-E trials, which studied patients with anorexia nervosa alone; however, the two open studies with transdiagnostic samples also included patients with anorexia nervosa [29,31▪]. Although these latter studies show positive effects of CBT-E in these samples, the anorexia nervosa subgroups were not analysed separately. Also, although CBT-E has been described as promising for the treatment of anorexia nervosa [37], the results are not consistent [38,39,40▪,41▪]. In an open trial, preliminary support was found for the use of CBT-E for anorexia nervosa [37]. In a subsequent implementation study of CBT-E for outpatients with anorexia nervosa, half of the patients did not complete CBT-E, whereas the remaining patients achieved a significant increase in BMI at 1-year follow-up [40▪]. In an open study among inpatients with anorexia nervosa, Calugi *et al.* [41▪] found that CBT-E was well accepted and might be a viable and promising treatment, even for those with severe and enduring anorexia nervosa. Overall treatment results of CBT-E for anorexia nervosa were poorer than CBT-E for other eating disorders; however, this finding needs to be interpreted in the broader context of treatment studies on anorexia nervosa with overall poor posttreatment outcome [42].

Some recommendations can be made for future research. A trial with a direct comparison between CBT-E and another CBT protocol might help unravel the differential effects of CBT-E, and studies on the working mechanisms of CBT-E could strengthen its theoretical foundation. On the basis of our results, we also recommend that researchers facilitate comparability between CBT-E studies. Agreement should be reached concerning, for example, what outcome variable to use to establish clinical significant change, what level of competence is needed for a CBT-E therapist, what tool should be used to measure treatment integrity and what specifically constitutes 'not completed' therapy.

This review has some limitations. First, the literature search and identification of relevant studies was done by one researcher (first author), implying that studies might have been missed and/or study characteristics or results may have been misinterpreted. Second, for practical reasons, only studies in the English language were included. Finally, the literature search was restricted to Medline, PsycINFO and Embase; although we tried to address this limitation by examining the reference lists of earlier meta-analyses and of the articles in this review, eligible articles may unintentionally have been missed.

CONCLUSION

There is robust evidence that CBT-E is an effective treatment for adult patients with an eating disorder, especially for bulimia nervosa, BED and OSFED. Future research on the working mechanisms and differential effects of CBT-E compared with other CBT protocols might reveal the theoretical foundations and specificity of CBT-E. To establish good comparability between studies, we recommend that agreement be made between researchers, in particular regarding the operationalization of clinical significant change and the use of standard definitions.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES AND RECOMMENDED READING

Papers of particular interest, published within the annual period of review, have been highlighted as:

- ■ of special interest
- ■■ of outstanding interest

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